STRUCTURE OF TOOL HANGING RACK HAVING DIRECTION-CHANGEABLE DIAGONALLY-ARRANGED DUAL-LAYERED RETENTION RECEPTACLE SLOT

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ABSTRACT
A tool hanging rack includes a rack member that is made of an aluminum based material and can be attached to wall through magnetic attraction, fastening, hanging, and suction cups, a plurality of tool holders slidably fit to the rack member, two end retention seats respectively fit to opposite ends of the rack member, and magnets mounted to a back side of the rack member. The rack member has a side forming a convexly curved surface and slide rails also forms channels for receiving the magnets. The end retention seats each form a support brace to provide additional support to the rack. The tool holder having a side forming a fitting section to fit to the surface and slide rails of the rack member and an opposite side forming a diagonally-arranged, double-side-open, dual-layered symmetric retention receptacle slot, which is selectively set leftward-facing or rightward-facing.
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TECHNICAL FIELD OF THE INVENTION

[0001] The present invention generally relates to a structure of tool hanging rack having a direction-changeable diagonally-arranged dual-layered retention receptacle slot, and more particularly to a tool rack structure specifically for hanging fixed spanners, which comprises a tool holder that is made to form a diagonally-arranged double-side-open, dual-layered symmetric retention receptacle slot that is selectively arranged to face leftward or rightward for hanging fixed spanners so as to meet the requirement of space and suit the needs of different hand convenience of users thereby providing a user-friendly arrangement.

DESCRIPTION OF THE PRIOR ART

[0002] Conventionally, hand tools are stored by being received in a tool box. This way, however, does not suit the need of efficiency in the modern society. Another conventional way of holding tools is to provide a board in which holes are formed for receiving pegs to insert therein to a wall and tools are held in the spacing between adjacent pegs. This is an impractical way. Further, a recent way of holding tools is to use magnets that attach the tools to a rack through magnetic attraction. However, due to potential risk of insufficiency of magnetic attraction force, the magnetically attached tools may be susceptible to undesired displacement and positional instability. Further, the pick-up of tools is also troublesome. This way is also impractical.

SUMMARY OF THE INVENTION

[0003] In view of these problems, the present invention aims to provide a structure of tool hanging rack that has direction-changeable diagonally-arranged dual-layered retention receptacle slots in order to overcome the problems associated with storage of spanner tools and allow for efficient and simple access and deposition of hand tools, thereby providing a user-friendly way of tool storage.

[0004] Thus, an objective of the present invention is to provide a tool hanging rack having a direction-changeable diagonally-arranged dual-layered retention receptacle slot, wherein a tool holder forming a double-side-open dual-layered symmetric slot that can be set for leftward facing or rightward facing to suit the needs of the hand convenience of a user.

[0005] Another objective of the present invention is to provide a tool hanging rack that carries a tool holder having a structure of double-side-open, dual-layered symmetric retention receptacle slot, which comprises inside and outside receptacles that are sized to receive and retain therein two spanner tools of different specifications.

[0006] A further objective of the present invention is to provide a tool hanging rack that comprises means for attaching the rack to a wall by means of magnetic attraction, fastening, hanging, or suction cups to receive and retain fixed spanners thereon, wherein the tool hanging rack comprises a rack member having a back to which magnets can be mounted or alternatively hanging bars are attached to opposite ends thereof or further alternatively suction cups are attached thereto to allow the tool hanging rack to change the way that it is fixed according the surrounding conditions.

[0007] To achieve the above objectives, the present invention adopts a technical solution that comprises the following components.

[0008] A rack member is preferably made of aluminum based materials and has a side forming a curvily convex surface having top and bottom edges respectively forming a groove to provide a slide rail. The rack member has a back forming two open channels that receive and retain therein powerful magnets.

[0009] A tool holder has a first side forming a fitting section that mates the curvily convex surface and the slide rails of the rack member and an opposite second side forming a diagonally-arranged, double-side-open, dual-layered symmetric retention receptacle slot.

[0010] According to the above structure, the present invention provides the following advantages:

[0011] (1) Since the tool holder is fit to the curvily convex surface and the slide rails of the rack member and since the diagonally-arranged double-side-open dual-layered symmetric retention receptacle slot of the tool holder can change direction to selectively face leftward or rightward, this structure can provide the best access angle for either a sinistral user or a dextrous user. This is the first advantage of the present invention.

[0012] (2) Since the tool holder forms a diagonally-arranged double-side-open dual-layered symmetric retention receptacle slot, two receptacles are provided for respectively receiving and retaining therein fixed spanners of different specifications, so that an effect of accommodating multiple tools can be realized. This is the second advantage of the present invention.

[0013] The structure of tool hanging rack having a direction-changeable diagonally-arranged dual-layered retention receptacle slot that realizes the effects of properly holding multiple tools and allowing for ready access of the tools will be described with further details in the following with reference to preferred embodiments thereof, which are shown in the attached drawings, in order to provide a better understanding of the present invention.

[0014] The foregoing objectives and summary provide only a brief introduction to the present invention. To fully appreciate these and other objects of the present invention as well as the invention itself, all of which will become apparent to those skilled in the art, the following detailed description of the invention and the claims should be read in conjunction with the accompanying drawings. Throughout the specification and drawings identical reference numerals refer to identical or similar parts.

[0015] Many other advantages and features of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a perspective view showing a tool hanging rack according to an embodiment of the present invention.

[0017] FIG. 2 is an exploded view of the tool hanging rack according to the present invention.

[0018] FIG. 3 is a cross-sectional view of the tool hanging rack according to the present invention.
FIG. 4 is a top plan view of the tool hanging rack according to the present invention.

FIG. 5 is a top plan view of the tool hanging rack according to another embodiment of the present invention.

FIG. 6 is a top plan view of the tool hanging rack according to a third embodiment of the present invention.

FIG. 7 is a perspective view illustrating hanging and retaining spanner tools on the tool hanging rack of the present invention.

FIG. 8 is an end view illustrating hanging and retaining spanner tools on the tool hanging rack of the present invention.

FIGS. 9A and 9B are top plan views respectively illustrating two additional embodiments of the tool hanging rack of the present invention.

FIG. 10 is an end view illustrating a further embodiment of the tool hanging rack of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following descriptions are exemplary embodiments only, and are not intended to limit the scope, applicability or configuration of the invention in any way. Rather, the following description provides a convenient illustration for implementing exemplary embodiments of the invention. Various changes to the described embodiments may be made in the function and arrangement of the elements described without departing from the scope of the invention as set forth in the appended claims.

Referring to FIGS. 1-3, which respectively illustrate a perspective view, an exploded view, and a cross-sectional view of a tool hanging rack according to an embodiment of the present invention, the tool hanging rack of the present invention comprises a rack member 1 made of an aluminum based material, a plurality of tool holders 2 that are slidably fit to the rack member, two end retention seats 3, and powerful magnets 4 mounted to a back of the rack member. The rack member 1 has a side forming a curved convex surface 10. The curved convex surface has opposite top and bottom edges respectively forming a groove and the groove forms a slide track 11. Two open channels 12 are defined in the back of the rack member 1 and each of the open channels 12 receives and holds therein the magnets 4, which can be bar like or block like magnets.

One side of the tool holder 2 forms a fitting section 20 that has a structure mating the curvedly convex surface 10 and the slide rails 11 of the rack member 1. An opposite side of the tool holder 2 forms a double-side-open, dual-layered, symmetric retention receptacle slot 21, which is arranged in a diagonal manner and is composed of two receptacles of different sizes.

The two end retention seats 3 are made to have a structure similar to that of the fitting section 20 of the tool holder 2.

With such components as discussed above, the fitting section 20 on the one side of the tool holder 2 is fit to the curvedly convex surface 10 and the slide rails 11 of the rack member 1 in a multiple number, whereby the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the multiple tool holders 2 are each fixed in a diagonal manner. The two end retention seats 3, which have the same structure as the fitting section 20 of the tool holders 2, are respectively fit into and fixed to opposite ends of the rack member 1 to complete the assembling of the tool hanging rack.

Referring to FIGS. 4 and 5, top plan views of two ways of embodying the present invention are illustrated. When the tool holder 2 is fit to the curvedly convex surface 10 and the slide rails 11 of the rack member 1 in a multiple number according to the direction illustrated in FIG. 3, the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the multiple tool holders 2 are fixed in a direction facing leftward. This arrangement provides leftward-facing diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the tool holders 2, which particularly suit the needs of hanging tools for a sinistral person.

When the tool holder 2 is fit to the curvedly convex surface 10 and the slide rails 11 of the rack member 1 in a multiple number according to the direction illustrated in FIG. 4, the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the multiple tool holders 2 are fixed in a direction facing rightward. This arrangement provides rightward-facing diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the tool holders 2, which particularly suit the needs of hanging tools for a dexterous person.

The arrangements of the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the tool holders 2 illustrated in FIGS. 4 and 5 are respectively fixed in leftward-facing (FIG. 4) and rightward-facing (FIG. 5) manners to meet user's hand convenience and thus allow for change of hanging direction of tools to thereby provide the effectiveness of hanging two spanner tools of different specifications in the two receptacles.

Referring to FIG. 6, a top plan view of a third way of embodying the present invention is illustrated. To provide universal use without discriminating left-hand and right-hand operations, the double-side-open, dual-layered, symmetric retention receptacle slots 21 of the tool holders 2 can be arranged in a non-diagonal but forward facing manner, whereby the universality of the forward-facing arrangement of the double-side-open, dual-layered, symmetric retention receptacle slots 21 of the tool holders 2 allows for ready hanging of spanner tools thereon.

Referring to FIGS. 7 and 8, which are respectively a perspective view and an end view illustrating hanging and retaining spanner tools on the rack of the present invention, a completely assembled tool hanging rack of the present invention is attached to a flat surface 100 of a wall by using the magnets 4 mounted to the back of the rack member 1 and in this application, the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of multiple tool holders 2 are arranged to be diagonally and outward facing. The diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the diagonally-arranged tool holders 2 can receive and retain a plurality of spanner tools 5 of different specifications thereon. Namely, each of the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the tool holders 2 can receive and retain therein two spanner tools 5, and thus, a great number of tools can be held on the rack.

Referring to FIGS. 9A and 9B, top plan views of two additional ways of embodying the present invention are shown. The end retention seats 3 that are fit to the opposite ends of the rack member 1 are alternatively provided with an
L-shaped hanging bar 6 (FIG. 9A), whereby the tool hanging rack can be mounted by hanging through the L-shaped hanging bars 6.

[0037] Further alternatively, the rack member 1 is provided with a suction cup 7 (FIG. 9B) attached thereto. The suction cup 7 provides a sufficient suction force to allow the tool hanging rack to be attached to a smooth surface of a wall or any site that supports the suction force of the suction cup.

[0038] The rack member 1 discussed above supports thereon a plurality of tool holders 2 and the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots 21 of the plurality of tool holders 2 receive and retain therein a plurality of spanner tools 5. This adds to quite a total weight as a combination of the rack member 1 and the tools carried thereby. Thus, the end retention seats 3 are alternatively and/or additionally provided with a support brace 30 (see FIG. 10), which serves to upward push and thus provide additional support force to the tool hanging rack which is supported by the magnets 4 mounted to the back of the rack member 1 receiving and carrying multiple tools thereon. In other words, the support braces 30 extending from lower sides of the two end retention seat 3 provide support on the opposite ends of the rack so that tool hanging rack that carries the total weight of multiple tools is not susceptible to positional instability and thus detachment, downward displacement, or shifting caused by insufficient magnetic attraction of the magnets 4, whereby stable and firm support to the rack is realized.

[0039] To conclude, the present invention overcomes the drawbacks of the conventional tool hanging racks and allows convenient and user-friendly applications of hanging tools and ready and quick access of the tools. Thus, the present invention provides industrial use and economic value.

[0040] While certain novel features of this invention have been shown and described and are pointed out in the annexed claim, it is not intended to be limited to the details above, since it will be understood that various omissions, modifications, substitutions and changes in the forms and details of the device illustrated and in its operation can be made by those skilled in the art without departing in any way from the spirit of the present invention.

1. A tool hanging rack comprising a rack member that forms slide rails, a plurality of tool holders slidably fit to the slide rails, two end retention seats respectively fit to opposite ends of the rack member, and magnets mounted to a back of the rack, characterized in that each of the tool holders has a first side forming a fitting section that has a structure mating a curvedly convex surface and the slide rails of the rack member and an opposite second side forming a diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slot, the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slots being each composed of receptacles of different sizes for receiving and retaining therein spanner tools of different specifications and being selectively oriented in different directions to allow for hanging the tools in the different direction and facilitate access of the tools by users of different hand conveniences.

2. The tool hanging rack according to claim 1, wherein the diagonally-arranged double-side-open, dual-layered, symmetric retention receptacle slot of each of the tool holders is alternatively set in a forward-facing fashion to receive and retain tools in the forward-facing manner.

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